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rendered impossible by that cause. The machines are particularly well calculated for canal-digging, as well as redeeming marshy lands, alluvial irrigated soils, and uncovering mining rocks, and, it is believed, chalk-cliff excavations.

MESSRS. YOUNG AND DELCAMBRE'S TYPE-SETTING
MACHINE.

BY THE SECRETARY.

It may be well to give a short explanation of the ordinary mode of setting up type before describing the mechanical contrivance for the same purpose by Messrs. Young and Delcambre.

The various letters and figures to be used in any composition are arranged in trays technically called cases. These cases have small compartments or boxes, differing in size according to the recurrence of the letters; thus e, the letter most used, requires the largest compartment. The boxes next in size are for the letters c, d, i, m, o, r, t, and u, and so on. The type-case stands upon a sloping frame of sufficient elevation for a man of ordinary height to pick out the letters or types from the various boxes. This person is called a compositor, and holds in his left hand what is called a composing-stick. In this composing-stick or metal trough (the length of which is adjustable to serve for lines of every length), he places the letters and the various spaces, quadrats, &c. which separate the words. It must be borne in mind that the same person who composes the type also justifies the page, that is, leaves it in a fit state to go into the printing-press, by adjusting each line to the exact length required for the width of the page on which he is engaged.

When the composing-stick is filled with eight or twelve lines of type, the mass is removed to and placed upon a galley or long tray, and the compositor again sets about refilling his stick. Of course, to make up a sheet it requires a number of pages, the arrangement of which is called imposing. But it is not here required to explain the operations of the printing-office further.

The upper part of Messrs. Young and Delcambre's machine consists of the type-reservoirs or grooves, each of which is $\frac{3}{16}$ ths of an inch in width, and of a depth equal to the length of the type, or nearly one inch.

These reservoirs are placed in a slightly inclined position to prevent the letters from falling out, the longest reservoirs in use

correspond with the largest compartments of the ordinary compositor's case, already noticed.

Immediately below the reservoirs are as many levers or cutters, the use of which is to cut off or displace laterally the bottom letter of each column of type. The cutters are worked by vertical steel rods, which are connected with the keys in front of the machine, and which latter are similar in appearance to the keys of a piano-forte.

The movement to effect the displacement of the types is one of the most beautiful contrivances in the whole apparatus. By pressing on any one of the keys, its vertical rod is drawn down, and the button at the top of the rod is pressed against the side of the contiguous lever or cutter, which is moved laterally and horizontally on a pivot; and the lever pressing against the lowest letter of the superincumbent column of type, pushes it through a lateral aperture, just as wide as the thickness of one type, which, thus liberated, is placed at the top of an inclined plate extending throughout the width of the machine at the back, and runs down a curvilinear track or groove, to take its place next the type previously sent down.

The inclined plate is constructed of brass, and contains several tracks or channels, down which the letters glide at intervals, regulated by the manipulation of the performer. The first curvilinear channel to the right hand serves for the letters a and b, the second for c and d, and so on, as the letter a is pushed towards the right hand, and b towards the left, so as to make each channel serve for two kinds. The forty-eight channels, therefore, serve for ninety-six kinds of type, and all the channels lead into each other in a serpentine manner, somewhat as in railway tracks, or the tracery of Gothic architecture, so as to converge into one single outlet at the bottom of the incline. These curvilinear channels are of equal length from the many points of delivery at the top of the incline, to the one single point of discharge at the bottom of the same, so that the types descend in equal times, and in the exact order in which the pianoforte keys are depressed.

At the point of discharge is an eccentric movement, worked by a treadle, to regulate the admission of the stream of type into a long open trough or channel, leading to the composing-stick, which is situated, as it were, at the end of the galley containing the column of the composed matter. The assistant slides so much of the long stream of type into the composing-stick as will form one line; the requisite spaces are then adjusted to make the line of the exact length, and, by a lever movement, the bottom of the composing-stick is withdrawn, which deposits the line of type on those previously set up in the galley; and, lastly, the long column of type, as that of a newspaper, is made up into pages as usual.

In this apparatus there are altogether ninety-six keys, of which seventy-two correspond with small Roman letters, figures, stops, &c., and the remaining twenty-four with the small-caps or capitals, which have reservoirs apart from the rest, and which are placed in the back of the machine.

When in full work as many as 8000 letters, &c. have been set up by this machine in an hour, whereas, by the ordinary mode, a good compositor can, on the average, only set up about 1700 letters in the same time; the wages paid in each case being nearly the same in amount.

HUGHES'S METALLIC LATH SUN-BLINDS.

THESE blinds are made either of brass-wire gauze, or iron-wire gauze painted.

The pulley lath is of the ordinary construction, but the movable laths present the novelty for which a license has been granted to Mr. Hughes for three years. Each of the movable laths is made of two thicknesses of the gauze; the upper thickness being lapped over the top edge of the under, with a space between them of about $\frac{3}{10}$ ths of an inch. The ends of the laths are bound with brass.

The cost of these blinds, if made of brass-wire gauze, and including the wooden frames, is at the rate of 10s. 6d. per foot superficial; but if of iron-wire gauze painted, at the rate of 3s. 6d. per foot superficial.

ON THE APPLICATION OF ELECTRICITY TO THE TRANSMISSION OF TELEGRAPHIC SIGNALS.

BY THE SECRETARY.

THE application of electricity to the transmission of signals by means of Messrs. Cooke and Wheatstone's telegraph is already in daily use on the Blackwall, Edinburgh and Glasgow, and Manchester and Leeds Railways. From the well-known experiments of Professor Wheatstone, it is ascertained that the electric current travels at the rate of 200,000 miles in a second of time; availing themselves of this important property, Professor Wheatstone and Mr. Cooke, who had both been labouring in the same field of extensive usefulness for a long time previously to their being associated as joint patentees of the invention, convinced the scientific world of the truth of their proposition, by laying down their telegraph, in the first instance, on the Great Western Railway, between Pad-